SECTION 06 20 00.01 00

FINISH CARPENTRY

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC PS 20	(2010) American Softwood Lumber Standard

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C20	(2003) Structural Lumber Fire-Retardant Treatment by Pressure Processes
AWPA C27	(2002) Plywood - Fire-Retardant Treatment by Pressure Processes
AWPA M2	(2015) Standard for Inspection of Treated Wood Products
AWPA M4	(2015) Standard for the Care of Preservative-Treated Wood Products
AWPA P5	(2015) Standard for Waterborne Preservatives

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA L870	(2010) Voluntary Product Standard, PS 1-09, Structural Plywood

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI AWS	(2009) Architectural Woodwork Standards

ASME INTERNATIONAL (ASME)

ASME B18.2.1	(2012; Errata 2013) Square and Hex Bolts and Screws (Inch Series)
ASME B18.2.2	(2010) Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
ASME B18.6.1	(1981; R 2008) Wood Screws (Inch Series)

ASTM INTERNATIONAL (ASTM)

ASTM D2898	(2010) Accelerated Weathering of Fire-Retardant-Treated Wood for Fire

Testing

ASTM D6007 (2014) Standard Test Method for Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber

ASTM D6330 (1998; R 2014) Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions

ASTM E1333 (2014) Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber

ASTM E84 (2015a) Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM F547 (2006; R 2012) Nails for Use with Wood and Wood-Base Materials

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.9 (2010) Cabinet Hardware

COMPOSITE PANEL ASSOCIATION (CPA)

CPA A208.1 (2009) Particleboard

GREEN SEAL (GS)

GS-36 (2011) Commercial Adhesives

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA LD 3 (2005) Standard for High-Pressure Decorative Laminates

FOREST STEWARDSHIP COUNCIL (FSC)

FSC STD 01 001 (2000) Principles and Criteria for Forest Stewardship

NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

NELMA Grading Rules (2013) Standard Grading Rules for Northeastern Lumber

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule 1168 (1989; R 2005) Adhesive and Sealant Applications

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003 (2002) Standard Grading Rules for Southern Pine Lumber

U.S. DEPARTMENT OF COMMERCE (DOC)

DOC/NIST PS58 (1973) Basic Hardboard (ANSI A135.4)

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)

WCLIB 17 (2004) Standard Grading Rules

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)

WWPA G-5 (2011) Western Lumber Grading Rules

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S.4 (2013) Preservative Treatment for Millwork

WOOD MOULDING AND MILLWORK PRODUCERS ASSOCIATION (WMMPA)

WMMPA WM 6 (1987) Industry Standard for Non-Pressure Treating of Wood Millwork

1.2 RELATED REQUIREMENTS

Refer to Section 01 91 00.01 15 TOTAL BUILDING COMMISSIONING AND 01 91 19.01 00 EXTERIOR ENCLOSURE COMMISSIONING for general Cx process requirements, definition of Cx team members, and delineation of responsibilities.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submittals with an "S" designation following the "G" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29.01 00 SUSTAINABILITY REPORTING. Other designations following the "G" designation identify the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00.01 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings; G JM

SD-03 Product Data

Engineered wood products; G J

Wood Items, and Trim; G JM

Interior Wall Panel System; G JM

Manufacturer's printed data, showing texture, density, catalog cuts, and installation instructions.

Wood Items, and Trim; G JM

Manufacturer's printed data indicating the usage of engineered or recycled wood products, and environmentally safe preservatives.

Adhesives; G J

Local/Regional Materials; G JS

Recycled Content; G JSC

Low Emitting Materials; G JSC)

SD-04 Samples

Moldings; G JM

High Pressure Decorative Laminate; G JM

Samples shall be of sufficient size to show patterns, color ranges, and types, as applicable, of the material proposed to be used.

SD-07 Certificates

Certificates of grade; G JSM

Certificates of compliance; G JSM

Forest Stewardship Council (FSC) Certification; G JSM

1.3.1 SUSTAINABLE DESIGN REQUIREMENTS

1.3.1.1 Recycled Content

Use materials or products where recycled content is clearly identifiable by the manufacturer, indicating the total sum of post consumer recycled content, plus one-half of the pre-consumer content. See Section 01 33 29.01 00 SUSTAINABILITY REPORTING LEED(tm) DOCUMENTATION for cumulative total recycled content requirements.

1.3.1.2 Local/Regional Materials

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. See Section 01 33 29.01 00 SUSTAINABILITY REPORTING LEED(tm) DOCUMENTATION for cumulative total local material requirements.

1.3.1.3 Low Emitting Materials

Use low emitting materials for all interior adhesives, sealants, paints, and coatings systems, in accordance with the following requirements:

All interior adhesives and sealants shall meet low-VOC requirements in accordance with SCAQMD Rule 1168, dated July 1, 2005.

All anti-corrosive and anti-rust paints applied to ferrous metal substrates shall meet low-VOC requirements in accordance with the GS-03, dated January

7, 1997.

All composite wood, agrifiber products, and laminating adhesives used for assemblies shall contain no added urea-formaldehyde.

1.3.1.4 Certified Wood

Wood products shall be certified as specified herein. See Section 01 33 29.01 00 SUSTAINABILITY REQUIREMENTS for cumulative total certified wood requirements.

1.3.1.5 Forest Stewardship Council (FSC) Certification

Use FSC-certified wood where specified. provide letter of FSC certification signed by lumber supplier. Indicate compliance with FSC STD 01 001 and identify certifying organization. Submit FSC certification numbers; identify each certified product on a line-item basis. Submit copies of invoices bearing the FSC certification numbers.

Certificates for Credit MR 7: Chain-of-custody certificates indicating that composite wood products comply with forest certification requirements. Include documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.

1.3.2 SHOP DRAWINGS

Include fabrication, installation details for fabrications, hardware components and accessories, showing plans, elevations, sections, details, construction and installation attachments to other work.

Include manufacturer's catalog data, including material descriptions for materials and accessories, dimensions of individual components and profiles, and finishes for each type of fabrication, hardware components and accessories of size, design, and location indicated.

1.4 CERTIFICATES

Provide certificates of grade from the grading agency on graded but unmarked lumber or plywood attesting that materials meet the grade requirements specified herein.

Provide certificates of compliance unless materials bear certification markings or statements.

Provide a letter of Certification of Sustainable Wood signed by the wood supplier. Identify certifying organization and their third party program name and indicate compliance with program requirements. Submit sustainable wood certification numbers; identify each certified product on a line item basis. Submit copies of invoices bearing certification numbers. Meet the requirements of this section, and document in accordance with Section 01 33 29.01 00 SUSTAINABILITY REPORTING.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver lumber, plywood, trim, and millwork to job site in an undamaged condition. Stack materials to ensure ventilation and drainage. Protect against dampness before and after delivery. Store materials under cover in a well-ventilated enclosure and protect against extreme changes in

temperature and humidity. Do not store products in building until wet trade materials are dry.

1.6 QUALITY ASSURANCE

1.6.1 Lumber

Identify each piece or each bundle of lumber, millwork, and trim by the grade mark of a recognized association or independent inspection agency that is certified by the Board of Review, American Lumber Standards Committee, to grade the species.

1.6.2 Plywood

Each sheet of plywood shall bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of the plywood. Mark shall identify plywood by species group or span rating, and shall show exposure durability classification, grade, and compliance with APA L870.

1.6.3 Hardboard and Particleboard

Materials shall bear a marking or statement identifying the producer and the applicable standard.

1.6.4 Pressure-Treated Lumber and Plywood

Each treated piece shall be inspected in accordance with AWPA M2.

1.6.5 Nonpressure-Treated Woodwork and Millwork

Mark, stamp, or label, indicating compliance with WDMA I.S.4.

1.6.6 Fire-Retardant Treated Lumber

Each piece to bear Underwriters Laboratories label or the label of another nationally recognized independent testing laboratory.

PART 2 PRODUCTS

2.1 WOOD

2.1.1 Virgin Lumber

Lumber fabricated from old growth timber is not permitted. Avoid companies who buy, sell, or use old growth timber in their operations, when possible. Lumber shall be FSC and SFI certified.

2.1.2 Engineered Wood Products

Products shall be FSC and SFI certified and shall contain no added urea-formaldehyde if exposed to interior spaces. Determine formaldehyde concentrations in air from engineered wood products under test conditions of temperature and relative humidity in accordance with ASTM D6007 or ASTM E1333. Products shall not be used if formaldehyde concentration is found to be greater than 0. Determine Volatile Organic Compounds (VOCs), excluding formaldehyde, emitted from manufactured wood-based panels in accordance with ASTM D6330. Products shall not be used if VOC emissions exceed limits set in HPSB guidelines or LEED requirements.

2.1.3 Natural Decay- and Insect-Resistant Wood

Naturally durable wood shall be FSC and SFI certified or salvaged. An occasional piece with corner sapwood shall be permitted if 90 percent or more of the width of each side on which the sapwood occurs is heartwood.

2.1.4 Sizes and Patterns of Wood Products

Yard and board lumber sizes shall conform to ALSC PS 20. Provide shaped lumber and millwork in the patterns indicated and standard patterns of the association covering the species. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the applicable standard.

2.1.5 Trim, Finish, and Frames

Provide species and grades listed for materials to be paint finished. Provide materials that are to be stain, natural, or transparent finished one grade higher than that listed. Provide species indicated for materials to be transparent finished. Run trim, except window stools and aprons with hollow backs.

TABLE OF GRADES FOR WOOD TO RECEIVE PAINT FINISH

Grading Rules	Species	Interior Trim, Finish, and Frames
WWPA G-5 standard grading rules	Aspen, Douglas Fir-Larch, Douglas Fir South, Engelmann Spruce-Lodgepole Pine, Engelmann Spruce, Hem-Fir, Idaho White Pine, Lodgepole Pine, Mountain Hemlock, Mountain Hemlock-Hem-Fir, Ponderosa Pine-Sugar Pine, (Ponderosa Pine-Lodgepole Pine,) White Woods, (Western Woods,) Western Cedars, Western Hemlock	All Species: C & Btr. Select (Choice & Btr Idaho White Pine) or Superior Finish. Western Red Cedar may be graded C & Btr. Select or A & Btr. per Special Western Red Cedar Rules.
WCLIB 17 standard grading rules	Douglas Fir-Larch, Hem-Fir, Mountain Hemlock, Sitka Spruce, Western Cedars, Western Hemlock	All Species: C & Btr VG, except A for Western Red Cedar
SPIB 1003 standard grading rules	Southern Pine	C & Btr

TABLE OF GRADES FOR WOOD TO RECEIVE PAINT FINISH		
Grading Rules	Species	Interior Trim, Finish, and Frames
NELMA Grading Ru standard grading rules	Balsam Fir, Eastern Hemlock-Tamarack, Eastern Spruce, Eastern White Pine, Northern Pine, Northern Pine, Northern White Cedar	All Species: C-Select except C & BTR for Eastern White Pine and Norway Pine

2.1.6 Shelving

Shelving shall be fabricated from 3/4 inch medium density particleboard. All shelving top and bottom surfaces shall be finished with HPDL. Shelf edges shall be finished HPDL or solid maple nosing as indicated.

2.1.6.1 Shelf Cleats

Shelf Cleats shall be 3/4 inch boards by depth as indicated with same surface finish as specified above for shelving.

2.1.7 Softwood Plywood

APA L870, thicknesses as indicated.

2.1.8 Hardboard

DOC/NIST PS58, standard type, 1/4 inch thick.

2.1.9 Particleboard

CPA A208.1, Grade 1-M-2 or 2-M-2 or better.

2.1.10 Adhesives

Comply with applicable regulations regarding toxic and hazardous materials, GS-36, SCAQMD Rule 1168, and as specified. Use water-based adhesives with maximum VOC content of 15 grams/liter for all interior applications. See Section 01 33 29.01 00 SUSTAINABILITY REQUIREMENTS for the low emissions requirements for interior adhesives, sealants, primers and sealants used as filler.

2.2 SOLID SURFACE COUNTERTOPS

For solid surface counter tops refer to Section 06 61 16.01 00 SOLID SURFACING FABRICATIONS.

2.3 MOISTURE CONTENT OF WOOD PRODUCTS

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products at time of delivery to the job site, and when installed, shall be as follows:

a. Interior Paneling: 6 percent.

b. Interior Finish Lumber, Trim, and Millwork 1-1/4 Inches Nominal or Less in Thickness: 6 percent on 85 percent of the pieces and 8 percent on remainder.

c. Moisture content of other materials shall be in accordance with the applicable standards.

2.4 PRESERVATIVE TREATMENT OF WOOD PRODUCTS

2.4.1 Non-pressure Treatment

Treat woodwork and millwork, in accordance with WDMA I.S.4, with either 2 percent copper napthenate, 3 percent zinc napthenate, or 1.8 percent copper-8-quinolinolate. Provide a liberal brushcoat of preservative treatment to field cuts and holes.

2.4.2 Pressure Treatment

Lumber and plywood used in contact with concrete shall be treated with water-borne preservative listed in AWPA P5 as applicable, and inspected in accordance with AWPA M2. Identify treatment on each piece of material by the quality mark of an agency accredited by the Board of Review of the American Lumber Standards Committee. Plywood shall be treated to a reflection level as follows:

Wood molding and millwork in contact with concrete shall be preservative-treated in accordance with WMMPA WM 6. Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWPA M4. Items of all-heart material of cedar, cypress, or redwood will not require preservative treatment, except when in direct contact with soil.

2.5 FIRE-RETARDANT TREATMENT

2.5.1 Wood Products

Fire-retardant treated lumber shall be pressure treated in accordance with AWPA C20. Fire-retardant treated plywood shall be pressure treated in accordance with AWPA C27. Material use shall be defined in AWPA C20 and AWPA C27 for Interior Type A and B. Treatment and performance inspection shall be by a qualified independent testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with ASTM D2898, Method A, prior to being tested for compliance with AWPA C20 or AWPA C27.

2.6 HARDWARE

Provide sizes, types, and spacings of manufactured building materials recommended by the product manufacturer except as otherwise indicated or specified.

2.6.1 Wood Screws

ASME B18.6.1.

2.6.2 Bolts, Nuts, Lag Screws, and Studs

ASME B18.2.1 and ASME B18.2.2.

2.6.3 Nails

Nails shall be the size and type best suited for the purpose and shall conform to ASTM F547. Nails shall be hot-dip galvanized or aluminum when used on exterior work. For siding, length of nails shall be sufficient to extend 1-1/2 inches into supports, including wood sheathing over framing. Screws for use where nailing is impractical shall be size best suited for purpose.

2.6.4 Adjustable Shelf Standards

ANSI/BHMA A156.9, Type B04071, with shelf rests Type B04081.

2.7 FABRICATION

2.7.1 Quality Standards (QS)

The terms "Premium," "Custom," and "Economy" refer to the quality grades defined in AWI AWS. Items not specified to be of a specific grade shall be Custom grade. The AWI QS is superseded by all contract document requirements indicated or stated herein.

2.8 INTERIOR WALL PANEL SYSTEM

System shall include prefinished wall panels, trim and accessories for attaching wall panels, including fastenings, accessory features, connections to the building structure, and other items which are necessary to make a complete installation. System to allow interchanging of components with a dry-fit installation. No liquid adhesives to be used.

Prefinished wall panel thickness shall be ¾ inch with concealed fasteners. Wall panel shall be maple veneer to match interior wood door panels per Section 08 14 00.01 00 Wood Doors. Panels shall have uniform thickness (+0.03") and flatness (maximum difference of 0.03") for 10-foot span. Flame spread (ASTM E84): Panels **AM#9... ...AM#9** to meet Class B requirements. Trim and clip material shall be a minimum 0.62 inch thick and fabricated from AI 6061-T6 where not seen and Al 6063-T5 where visible. Panel trim for joints, edges and corners shall be as shown on the drawings.

All system fabrications, system trims per plans details and panel clips, shall be factory installed on the back of all wall panels. Kerfs edges for vertical joints, ease all edges and prefinished all edges. Field modifications are possible by the installer/contractor using hand tools that meet the above requirements. Panel edges shall be sealed after field cutting, before installation.

Sub-frame assembly aluminum "Z" clips and trim to be manufactured specifically to handle the weight of wall panels up to 6' high x 12' wide. Fasteners for panel assembly to be designed to keep panels consistantly flat at each joint. System shall provide a minimum 3/8" ventilation gap between the wall and the back side of the panel clip, to prevent condensation behind the panels.

2.9 HIGH PRESSURE DECORATIVE LAMINATE (HPDL)

All plastic laminates shall meet the requirements of ANSI/NEMA LD 3 and ANSI A208.1 for high-pressure decorative laminates. Design, colors, surface finish and texture, and locations shall be as indicated on Section 09 06 90.01 00 COLOR SCHEDULE. Submit two samples of each plastic laminate pattern and color. Samples shall be a minimum of 5 by 7 inches in size. Plastic laminate types and nominal minimum thicknesses for casework components shall be as indicated in the following paragraphs.

2.9.1 Horizontal General Purpose Standard (HGS) Grade

Horizontal general purpose standard grade plastic laminate shall be 0.048 inches (plus or minus 0.005 inches) in thickness. This laminate grade is intended for horizontal surfaces where postforming is not required.

PART 3 EXECUTION

3.1 FINISH WORK

Provide sizes, materials, and designs as indicated and as specified. Apply primer to finish work before installing. Where practicable, shop assemble and finish items of built-up millwork. Joints shall be tight and constructed in a manner to conceal shrinkage. Miter trim and moldings at exterior angles and cope at interior angles and at returns. Material shall show no warp after installation. Install millwork and trim in maximum practical lengths. Fasten finish work with finish nails. Provide blind nailing where practicable. Set face nails for putty stopping.

3.1.1 Interior Finish Work

After installation, sand exposed surfaces smooth.

3.2 SHELVING

Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled. Space fasteners not more than 16 inches o.c. Use 2 fasteners at each framing member or fastener location for cleats 4 inches nominal in width and wider. Apply a bead of multipurpose construction adhesive to back of shelf cleats before installing. Remove adhesive that is squeezed out after fastening shelf cleats in place.

3.3 TRIM

Trim shall be installed straight, plumb, level and with closely fitted joints. Exposed surfaces shall be machine sanded at the mill. Molded work shall be coped at returns and interior angles and mitered at external corners. Intersections of flatwork shall be shouldered to ease any inherent changes in plane. Blind nailing shall be used to the extent practicable, and face nailing shall be set and stopped with a nonstaining putty to match the finish applied. Screws shall be used for attachment to metal; setting and stopping of screws shall be of the same quality as required where nails are used.

3.3.1 Interior Wall Panel System

Install panels and fixing system as per manufacturer standards. Install aluminum sub-frame to support the "Z" clip sub-frame assembly. Do not

exceed manufacturer's maximum fixing distances:

Install panel clip system true and plumb. Installed panels shall have vertical joints with splines routed directly in the center of the panel edge to ensure that all four intersecting panels are kept in the same plane.

-- End of Section --